

Browne (B. B.)

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FEMALE SEXUAL ORGANS

Resulting from Arrest of Development.

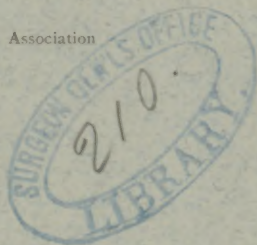
BY B. BERNARD BROWNE, M.D.,

Professor of Gynæcology and Obstetrics in the Baltimore Polyclinic and
Post-Graduate Medical School; Professor of Diseases of Women
in the Woman's Medical College of Baltimore; Fellow
of the American Gynæcological Society, etc.

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MALFORMATION OF THE FEMALE SEXUAL ORGANS, RESULTING FROM ARREST OF DEVELOPMENT.

We learn the functions of an organ, not only by observing the part it performs when present in the system, but also by noting the consequences of its absence.

The cases which we will consider render it evident that the excitement and increased vitality of the sexual organs by which menstruation is preceded are not dependent, as was once supposed, upon any congestion or distension of the vessels of the uterus, or upon any other change in the condition of that organ.

They also show us that the peculiar external characteristics of the female form, and the possession of sexual sensibility, are not all owing to the uterus, and are in no way connected with its presence or development.

Indeed there can be no doubt that the often quoted aphorism of Van Helmont—*propter solum uterum mulier est id quod est*—is perfectly erroneous, and that the distinguishing attributes of womanhood derive their origin not from the uterus, but from the far more important energies of the ovaries and Fallopian tubes.

As many of the abnormal and pathological conditions of the female sexual organs are the result of defective development, occurring either during the period of intra-uterine growth or at the period of puberty, and as several of the cases which I will relate in this paper are the results of such arrest, it may be well to pass briefly in review the different stages of normal development.

About the sixth week of intra-uterine growth the primary elements of the uterus, consisting of a pair of filamentous organs situated on either side of the inferior portion of the vertebral column, and between it and the Wolffian ducts, make their appearance.

These cords, which at first are solid, afterwards become perforated, and are known as Müller's ducts; out of these the Fallopian tubes, uterus and vagina are developed.

Posterior to Müller's ducts and anterior to the rectum a mass of tissue is developed, which helps to form the recto-vaginal wall above and the perinæum below.

Anteriorly Müller's ducts unite with the lower portion of the bladder, and aid in the formation of the urethra, forming the upper portion of its posterior wall.

At about the seventh week the upper portion of Müller's filaments become slightly enlarged and club-shaped; at the lower end of this enlargement they gradually coalesce, and at this point the round ligament is given off, the upper portion separates and forms the Fallopian tubes, while the lower portion forms the uterus and vagina. The point where the coalescence occurs, and where the round ligaments originate, affords a sure point of demarkation between the uterus and Fallopian tubes which in many cases is of great importance.

At about the eighth week the lower portion of the cords, which are hollow, gradually coalesce until by union they exhibit a right and left cavity separated by a septum.

The lower portion of this septum gradually disappears and the outer walls become somewhat thicker until about the fifth month, when the uterus and vagina are distinctly separate.

The upper portion of the uterus at this period is represented by two diverging horns or processes,

During the sixth and seventh months the uterus becomes more cylindriciform and of greater bulk, its horns diverge less than before, and from being drawn into the substance of the uterus they seem to be disappearing.

At this period the increased bulk becomes more marked in the cervix, its walls exceeding in thickness the walls of the body of the uterus.

During the eighth and ninth months of foetal life the disproportion between the thickness of the walls of the body and neck of the uterus continues, and the substance of the cervix considerably exceeds that of the body of the uterus.

This condition exists at the time of birth and is known as the *uterus foetalis* or *infantilis*. The uterus has now undergone its primary development and its further growth ceases until the period of puberty, when it is to perform its normal function. A few changes, however, do take place in it during this period, at the time of second dentition, the *palma plicata* of the body of the uterus disappears, and the bulk of the body and cervix become more equal and the organ descends somewhat in the pelvic cavity.

Cases of Amenorrhœa from Congenital Malformation. Miss J. D., age 21, of small stature and delicate physique, has never menstruated nor had any of the premonitory symptoms, the breasts were slightly developed. The external organs of generation were of the ordinary appearance, but when the labia were separated the urethral orifice which was patulous and would admit the tip of the index finger came into view, but the orifice of the vagina was closed, or rather ended in a cul-de-sac about an inch and a quarter deep. The index finger of the right hand was passed gently into the bladder and two fingers in the rectum in order to determine whether the uterus was present or not, when the anterior wall of the rectum was pushed forward by the fingers it came in con-

tact with the finger in the bladder, only the septum being between, no uterus could be felt, in fact about the same sensation was obtained as when the finger in the vagina presses its anterior walls against the finger in the bladder, no ovaries could be detected, the girl had suffered from repeated nasal hæmorrhages, not, however, of a periodical character, she also suffered at times with severe headaches.

In this case the examination revealed the fact that the uterus was not present unless in a very rudimentary form, that although the ovaries could not be felt they were probably partially developed, and that an almost complete arrest of development had taken place in the lower portion of Müller's ducts.

Miss A. R. had suffered for four or five years with periodical headaches, accompanied by intense pain in the abdomen, had never menstruated, although she had taken medicine at various times for the purpose of bringing on her courses. Upon making an examination of the parts the external genital organs were found normal, the hymen which was thick and hard was intact, and nearly closed the vaginal orifice, a small opening only existing in the centre, on passing a sound through this opening a cavity was found beyond which contained no fluid. The hymen was cut through and a small infantile cervix was found projecting into the vagina, the uterus measured only an inch and a half in depth, more than an inch of this belonged to the cervix, the body of the uterus was very thin, and its cavity was not over a quarter of an inch in depth.

Considering this case as one of undeveloped infantile uterus where the arrest of development had taken place either just before or about the time of puberty, some means seemed called for to restore the normal nutrition of the organ and to stimulate it to perform its physiological function.

For this purpose the faradic current was used of

moderate strength, the cathode to the cervix, the anode to the spine along the lumbar and sacral regions. The first application was made a few days before the expected time for the return of the periodic headaches, at which time she noticed a slight show of blood, the first she had ever seen; her headache was much diminished and she had only slight pains in the pelvic region.

Her second menstruation occurred more freely, and her general health has much improved; by the third month her menstruation was about normal and her uterus measured $2\frac{1}{4}$ inches. The application was continued once a week for three months; after the first month the cathode was passed *into the uterus*.

Miss M. T., age 19, of small figure and defective development, was brought to me by her aunt, who stated that the girl had never had her courses, but that lately she had been suffering intense pain in the head, which occurred about once a month, and was generally relieved by the occurrence of a hæmorrhage from the nose, which frequently continued for several hours. Upon examination, the uterus was found small, its cavity measuring only one inch, the cervix presenting the appearance of a small nipple projecting into the vagina, the external os was small, admitting with difficulty the smallest probe. The faradic current was used as in the preceding case and in about three months normal menstruation was restored; the girl developed, and her general health became good; the uterus enlarging to about its proper size.

Kussmaul makes the following very practical distinction between the two arrests of extra-uterine development termed *Uterus Fœtalis* and *Uterus Infantilis*.

The uterus fœtalis has the form of that belonging to a fœtus at full term. The body is small, six or nine lines in height, and ten to twelve in breadth;

the neck, which forms the greater mass, is from 18 to 20 lines in length. The cavity of such a uterus, especially that of the body, is either wanting or very small.

In those cases, however, which we regard as *uterus infantilis* the organ, on the whole, has the form of a virgin one, but is altogether smaller; the most important anomaly is an excess of connective tissue in its walls, which renders them denser and more resisting, the mucous membrane is paler and thinner, and in many instances the rugæ of the cervical canal are imperfect.

The vaginal portion of such a uterus is either very small or entirely absent. Sometimes its presence is indicated by a wart-like prominence with a slight depression leading to the cervical canal.

Mrs. E. S., age 25, married four years; sterile; suffers from amenorrhœa and excessive pain; has her menses at the regular time, but only a few drops. Her uterus was found anteflexed, the cervix conical and indurated. This condition is a very frequent one in sterile women, and results from an arrest of development taking place at the period of puberty. According to Emmet, flexures of the cervix have their origin at this period, or shortly afterwards, by the balance being lost between the relative growth of the body and cervix.

From the earliest development of the uterus, as a rule, until pregnancy, some degree of anteversion exists. With the uterus in this position, the neck cannot be developed to its full length without forcing the cervix forward in the axis of the vagina in the direction offering the least resistance. As the body of the uterus lies forward, the cervix must become bent upon itself at or near the vaginal junction, and thus the flexure is formed. This must take place or the uterus will become retroverted, the result being deter-

mined by the fullness or absence of the posterior cul-de-sac of the vagina.

When the cervix is small enough in diameter to be readily bent upon itself the flexure is formed, but if the contrary be the condition and the cul-de-sac be small, retroversion of the organ will occur. Versions of the uterus when they result from defective development have their origin most frequently in a deficient development in the shape and size of the vagina. In such instances the vagina terminates around a cervix of unusual length without forming a posterior cul-de-sac. The consequence is that the neck of the uterus being too long is necessarily crowded forward in the vagina, in the direction offering the least resistance, and retroversion follows. This result may be considered a mechanical one and due to a congenital curve or defect.

Lateral Versions are seldom congenital, but ordinarily result from shortening of the broad ligament after an attack of cellulitis.

In the two following cases of arrest of development, I had the opportunity of seeing the post-mortem results:

CASE I. A lady, aged 19, who four days previous to her death, had a profuse epistaxis lasting about 48 hours, which, taken with the fact that she had never menstruated, and that the nose bleedings were frequent, induced an examination post-mortem of the organs of generation.

The vulva was natural in formation and appearance, with the *mons veneris* and external surface of the labia major well covered with hair; no clitoris could be perceived. The vagina was a simple cul-de-sac about two inches long. It was destitute of rugæ, hymen and caruncula, and had no communication with an os uteri. The bladder and rectum were firmly adherent to each other instead of being separated by a uterus, which was searched for in vain. The bond of

adhesion between the bladder and the rectum was the broad ligament occupying its usual position, of a crescent shape, and embedded in a thin horn of this crescent near the summit about one inch and a half internal to, and on the line with, the iliac fossa, was a nodular body dense in structure of the size of an apricot kernel, to which were attached a perfect ovary, Fallopian tube and round ligament. The parts adjacent to the ovaries were greatly congested. The nodular bodies referred to were what would correspond to the superior cornua of the uterus, and the non-striated muscular fibre found in a section confirmed this impression of its being uterine tissue. In this case the patulous condition of the urethra led to the belief that sexual intercourse had taken place.

Case 2. Mrs. A. P. F., age 34, married 10 years, had never menstruated or manifested any menstrual molimen. She was exceedingly well developed and there was no deficiency of sexual desire or excitability. On the contrary, she had been subject to intense sexual excitement occurring at irregular intervals and generally continuing several days. The mammae, the vulva, the mons veneris, and the pelvis externally were found to be perfectly developed.

The vaginal touch showed that the vagina terminated in a cul-de-sac at a depth of 2 inches. A steel male bougie carried into the bladder could be swept freely to the right and left, and the finger introduced into the rectum, could be felt pressing against it; through the walls of the bladder and rectum a slight elevation on each side of the median line could be felt and was regarded as a rudimentary uterine mass.

On account of the severity of the epileptic seizures her intellect had become gradually impaired.

The post-mortem examination disclosed the following facts. A hard conical nodule was found, on introducing the hand through the abdominal incision, on each side, the two meeting behind the bladder.

The finger introduced into the vagina was arrested at about 2 inches, and above this point to the union of the nodules above, a distance of about $1\frac{1}{2}$ inches, nothing existed in the way of fibrous cords, nor the slightest canal.

This was a uterus bipartitus, the body and cornua were solid and contained no cavity.

Complete absence of the uterus has been doubted by many, partly because a more careful study of cases recorded as authentic rendered the presence of rudiments of a uterus presumable or evident, and partly because cases of absence of uterus which are founded simply on examination of living women do not seem sufficiently conclusive, and to this class by far the greatest number of recorded cases belong.

Inasmuch as the Fallopian tubes, uterus and vagina are developed from Müller's ducts, as we have seen, the existence of any, even a small portion of the vagina may be accepted as evidence that the development of the uterus and Fallopian tubes also has at least been attempted, though that development may have been interrupted at any point. Some rudiments of the uterus may therefore be assumed to exist. Notwithstanding this it has been proved that the uterus may be entirely absent, and in such cases the ovaries and tubes may either exist in a rudimentary condition or be also entirely absent. In the former case the round ligament branch off at the inner extremities of the ovaries.

If the uterus, ovaries and tubes are absent the external genitals may be either perfect or defective. Whenever the external genitals are perfectly developed, rudiments of a vagina generally exist, and in these cases the urethra is most frequently found very much dilated, so much so that it has frequently served as a vagina.

Emmet reports a case where a surgeon incised a

dilated urethra mistaking it for the vagina, and causing incontinence of urine.

An erroneous idea seems to be prevalent that in cases of congenital atresia of the vagina, a patulous urethra always indicates that sexual intercourse has taken place through this organ. This patulous condition of the urethra is the result of an arrest of development and almost invariably accompanies congenital atresia of the vagina, arrest of development has taken place in Müller's ducts, and the anterior portion of them which joins the bladder and forms the posterior wall of the urethra, is not developed; consequently the opening of the urethra is larger, and is situated below and internal to its normal position—almost in a line with the normal opening of the vagina—and therefore the vagina being closed by atresia, the urethra would more easily receive the male organ. This patulous condition is the primary one, and is the *cause* and not the *result* of penetration. Moreover in cases of *acquired* atresia of the vagina the urethra is never patulous, and sexual intercourse never takes place through it, but on the contrary, the seat of obstruction in the vagina is gradually pushed back by the penis. In these cases of congenital patulous urethra, there is never incontinence of urine.

Morgani, *De sedibus et causis morborum*, Lib. III, Ep. 46, relates two interesting cases of congenital atresia of the vagina with defective development of the uterus and patulous urethra.

The first case he describes as follows: "The vulva of the woman was in a perfect and natural state. But that canal, as they called it in the time of Celsus, into which it opens, and which we now call the vagina, had scarcely run on more than a third part of its proper length, when it suddenly terminated. There was no cicatrix at that place nor below it; the woman herself or her parents could none of them

call to mind any ulcer, or any other preceding disorder, in consequence of which the sides of the vagina might have coalesced, for if these parts are ulcerated either from the lues venerea, from the difficult birth or from any other cause where the carelessness of the surgeon or the midwife has coöperated with the disorder, how easily the sides of this canal may grow together. However, not only nothing of that kind had preceded in this woman, but every part moreover, being smooth, shining, and equal when you had opened and dilated the vagina as far as the occlusion, nor indeed did this occlusion in the least give way either to the finger or to the penis of the husband, which had now for three years' space been frequently forced against it."

In Morgani's second case, the woman stated that she was not indeed imperforate, but had so very narrow an aperture, that an eminent physician in a city of great learning, who was at the same time a surgeon, having examined her in early puberty, advised that this aperture should be gradually dilated by introducing such things as were proper for that purpose; but that everything else a more mature age, and a husband, if she should marry, would accomplish. She stated that she had introduced something of the kind recommended, and in some measure had succeeded in dilating somewhat the orifice of the foramen; but could bear no further dilatation, that her husband also, to whom she had been married three years, had by frequent attempts somewhat enlarged the same orifice, but could never enter it. Morgani goes on to state that when he examined the woman and saw the foramen of which she had spoken, he immediately knew that it was the orifice of the urethra out of its situation; and that thanks ought to be given to God, that the woman could not suffer any further dilatation of that passage, as, if she had, the consequence without doubt, would have

been, that she could never have retained her urine. Upon further examination, he found the vagina occluded entirely by a solid thick membrane, and he believed the uterus to be absent.

M. Ad. Burggrave, Professor of Anatomy in the University of Ghent, has recorded in the *Annales d'occulis, et de Gynecol.*, 1839, the two following instances of complete absence of the uterus which had come under his own observation :

In the *first case* the vulva had no vaginal orifice ; the urinary meatus was situated in the centre of this latter, the contour of which had been ruptured in the act of copulation, readily permitted the introduction of the finger into a sac, the parietes of which were soft and membranous, and which was easily recognized as the bladder. When a catheter was introduced into this sac and the finger into the rectum at the same time, it was evident that there existed no organ between the intestine and bladder, that these were in immediate contact, as is the case in the male sex.

In the *second case* the absence of the uterus was verified by post-mortem examination. The subject of this was a woman 23 years of age, who died in the Civil Hospital of Ghent, of arachnoiditis.

This woman was of robust constitution and plethoric habit ; her mammae were well developed, pelvis large ; sexual parts well covered with hair. The vulva presented only a very large meatus, the circumference of which was irregular and furnished with numerous myrtiform caruncles. This meatus led immediately into the bladder, which was in direct contact with the rectum. The ureters, instead of descending toward the base of the vesical triangle, opened immediately within and on the side of the urinary meatus, so that the bladder was situated behind these conduits. The orifices of the urethra were surrounded by sphincters, which were capable

of closing them and thus preventing the immediate flow of urine.

Beyond these sphincters the ureters were very much dilated, and this enlargement extends to the kidneys, so that during life these passages had performed the office of reservoirs. The genital apparatus consisted of two ovaries, well formed, situated in the folds of the peritonæum, and containing numerous ova, many of which were in the hydatid state. In the same peritoneal fold, and immediately in front of the ovaries, were the Fallopian tubes; these last had no canal, and were enveloped in a thick mass of erectile tissue. These tubes were joined behind the bladder without communicating one with the other. The subject of this case had never menstruated, and had manifested very marked venereal appetite.

One of the earliest recorded cases of arrest of development and absence of the uterus is related by Realdus Columbus in his work, "*De Re Anatomica*," in 1572. It is described as *vulva rara*.

In Case 2 the condition of the hymen as being dense and hard, and nearly closing the vaginal orifice, is mentioned.

There is another condition which is frequently confounded with imperforate hymen; this is an occlusion of the lower portion of the vagina immediately behind the hymen. This occlusion is of embryonic origin, and is caused by defective development of the lower portion of Müller's ducts, and is sometimes improperly described as a double hymen. More frequently, however, it is overlooked or mistaken for the hymen itself, from the fact that it is pressed forward by the accumulated blood in hæmatometra and hæmatokolpos, and lies almost in immediate contact with the hymen.

I will state the following conclusions:

1st. Nearly all the malformations of the female

sexual organs, previous to puberty, result from arrest of development.

2nd. As the upper and lower portions of Müller's ducts develop independently of each other, we may find the ovaries developed without the uterus, and *vice versa*.

3rd. Perfect development of the external genital organs and the mammary glands does not preclude defective development of the vagina, uterus or ovaries.

4th. Entire absence of the uterus or the ovaries can only be determined by post-mortem examination or by laparotomy.

5th. A patulous urethra is not the result of sexual intercourse through this organ, but is caused by arrest of development.

6th. In congenital atresia of the vagina a patulous urethra is the rule, in acquired atresia it is the exception.



